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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/387,894      | 09/01/1999  | AMITAVA GUHA         | 20721/04404         | 3143             |

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EXAMINER

WILKINS III, HARRY D

ART UNIT

PAPER NUMBER

1742

DATE MAILED: 01/28/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

| Case Number | Ctry | Sub Case | Action Due    | Due Date    |
|-------------|------|----------|---------------|-------------|
| 2072104404  | US   |          | RESP DEADLINE | 28-Apr-2002 |
|             |      |          | 1ST EXTENSION | 28-May-2002 |
|             |      |          | 2ND EXTENSION | 28-Jun-2002 |
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|                              |                      |              |
|------------------------------|----------------------|--------------|
| <b>Office Action Summary</b> | Application No.      | Applicant(s) |
|                              | 09/387,894           | GUHA ET AL.  |
|                              | Examiner             | Art Unit     |
|                              | Harry D Wilkins, III | 1742         |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 22 January 2002.

2a) This action is FINAL. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-3,5-12 and 15-34 is/are pending in the application.

4a) Of the above claim(s) 15-21 is/are withdrawn from consideration.

5) Claim(s) \_\_\_\_\_ is/are allowed.

6) Claim(s) 1-3,5-12 and 22-34 is/are rejected.

7) Claim(s) \_\_\_\_\_ is/are objected to.

8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on 01 September 1999 is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) The proposed drawing correction filed on \_\_\_\_\_ is: a) approved b) disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.

12) The oath or declaration is objected to by the Examiner.

#### Priority under 35 U.S.C. §§ 119 and 120

13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some \* c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a)  The translation of the foreign language provisional application has been received.

15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

#### Attachment(s)

|  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                             | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

1. Claims 1-3, 5-12 and 15-34 are pending. Claims 15-21 have been withdrawn from consideration as being drawn to a non-elected invention.
2. The rejection under 35 USC 103 based on the Harkness et al reference is clarified below, thus necessitating new grounds of rejection and the withdrawal of the finality of the previous action.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-3, 5, 6-12 and 22-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harkness et al.

Harkness et al disclose several Ni-Be alloys. One example contains 2 wt% Be, 0.5 wt% C and balance Ni and another contains 1.85 - 2.05 wt% Be, 0.4-0.6 wt% Ti and the balance Ni (pg. 423, Table 13). Harkness et al further disclose that the beryllium nickel casting alloys are used as tools (pg 423, col 1). Harkness et al disclose that the Ni-Be alloy can be unaged (pg. 426, Table 17).

Harkness et al do not specifically teach using the under-aged alloy as a final product. However, one of ordinary skill in the art would have considered it obvious to use an under-aged product because of the benefit of increased tool life. One of ordinary skill in the art would have been motivated to age the tool alloy to the minimum

Art Unit: 1742

required properties (e.g.-hardness, strength, etc.) (i.e.-underage) and to not age the tool alloy to the peak values because, by doing so, the length of time that the tool could be in service would have been increased because the amount of time it would take to reach the overaged portion of the aging curve (i.e.-where properties are no longer sufficient for the tool's purpose) would be increased.

In the present application, the Examiner finds that the taught alloy would have been expected to possess the ability to contact molten metal at elevated temperatures due to the elevated temperature strength (Fig 19).

With respect to claim 2, Harkness et al disclose that many of the casting alloys are used in molds (pg 423, col 1). It is the Examiner's position that it would have been within the expected skill of a routineer in the art to use the conventional Ni-Be alloys for molds in casting of metals because the Ni-Be alloys have been known to be used as molds and the Ni-Be alloys provide good high temperature strength.

Regarding claims 3 and 5, Harkness et al disclose (see pg 426, Table 17) a thermal conductivity of 28 to 51.1 W/m-K (16.2-29.5 BTU/ ft-hr-°F).

Regarding claims 6, 24 and 29, Harkness et al disclose a hardness of the Ni-Be alloy being less than 90% of its peak aged hardness (pg 424, fig 17).

Regarding claims 7, 25 and 30, Harkness et al do not disclose a Ni-Be alloy where the hardness is 75% or less than its peak aged hardness. According to fig 17, harkness et al disclose a hardness of about 80% of the peak aged hardness.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to find an optimum starting hardness, since it has been held that

where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. *In re Aller*, 105 USPQ 233.

Regarding claims 8, 26 and 31, Harkness et al disclose alloys containing C and Ti (pg 423, Table 13). Furthermore, Harkness et al disclose that the alloys can contain varying amounts of Cr, Mo, Al, Co and Ti (pg 426, col 1).

Regarding claims 9 and 27, Harkness et al disclose 2.0 wt% Be (pg 423, Table 13).

Regarding claim 10, since the amount of Be in Harkness et al is 2.0 wt%, the Examiner finds that the taught alloy would have been expected to possess an amount of Be being sufficient so that a continuous coating of beryllium oxide forms on the surface of the tool, but not so great that the alloy becomes brittle.

Regarding claim 11, Harkness et al do not teach the type of molten metal which can be used in the disclosed mold.

It is well known in the prior art that aluminum, magnesium, copper, zinc and their respective alloys are poured in molten form into a die and then allowed to solidify.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the mold of Harkness et al for solidification of aluminum, magnesium, copper, zinc and respective alloys because the Ni-Be alloys have high thermal conductivity and high elevated temperature strength.

Regarding claim 12, Harkness et al disclose 2.0 wt% Be (pg 423, Table 13).

Regarding claims 22, since the amount of Be in Harkness et al is 2.0 wt%, the Examiner finds that the taught alloy would have been expected to possess an amount of Be being sufficient so that a continuous coating of beryllium oxide forms on the surface of the tool, but not so great that the alloy becomes brittle.

Regarding claims 23, 28 and 32, Harkness et al disclose that the Ni-Be alloy can be unaged (pg. 426, Table 17).

Regarding claims 33 and 34, Harkness et al disclose 2.0 wt% Be (pg 423, Table 13).

#### ***Response to Arguments***

5. Applicant's arguments with respect to claims 1-34 have been considered but are moot in view of the new ground(s) of rejection. It should be noted that a motivation has been added why one of ordinary skill in the art would have considered it obvious to use an underaged alloy.

#### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harry D Wilkins, III whose telephone number is 703-305-9927. The examiner can normally be reached on M-F 7:30am-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V King can be reached on 703-308-1146. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Art Unit: 1742

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Harry D Wilkins, III  
Examiner  
Art Unit 1742

ROY KING  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700

hdw  
January 24, 2002